

Geodetic Evidence for Distributed Flow Below the Brittle Crust of the Walker Lane, Western United States

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Faults in the Earth's crust are predominately modeled as elastic dislocations with a down-dip continuation of the faults into the viscous lower crust. The resulting surface deformation features strain rate accumulation concentrated across locked faults during the interseismic period. We use high-precision GPS data across four strike-slip faults in the northernmost region of the Walker Lane (WL), USA, to find no evidence of strain localization, instead observing a constant shear strain rate across the WL. Furthermore, we observe similar distributed shear strain rates for the central WL, even though the geology and fault geometry are different. We conclude that the geodetically observed surface deformation reflects distributed rather than discrete deformation in the ductile portion of the crust.

